Springfield IM 091-1(83)
Presentation to the Town of Springfield

Interstate 91 – Bridges #25 N&S over US Route 5
Interstate 91 – Bridges #26 N&S over Black River
Interstate 91 – Bridges #27 N&S over Toonerville Rail Trail
Interstate 91 – Bridges #28 N&S over US Route 5

April 25, 2022

HNTB

VERMONT
AGENCY OF TRANSPORTATION

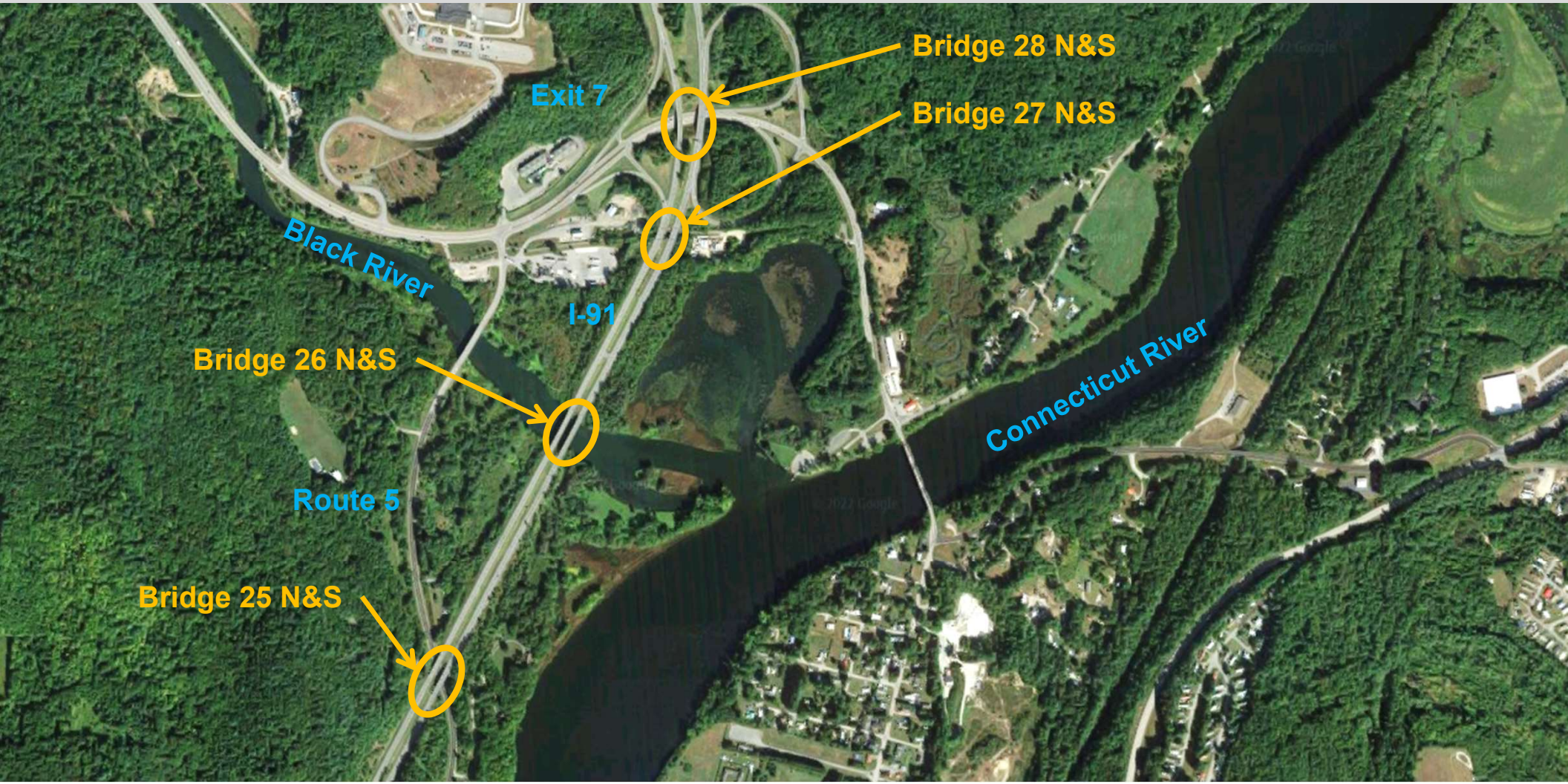
Meeting Agenda

- Meeting Purpose
- Project Overview and Location
- Bridge 25 N&S Evaluation
- Bridge 26 N&S Evaluation
- Exit 7 Evaluations
  - Exit 7 Conditions and Considerations
  - Bridges #28 N&S
  - Bridges #27 N&S
  - Exit 7 Recommendations
- Toonerville Rail Trail Discussion
- Maintenance of Traffic Discussion
- Project Recommendations Summary

Meeting Purpose

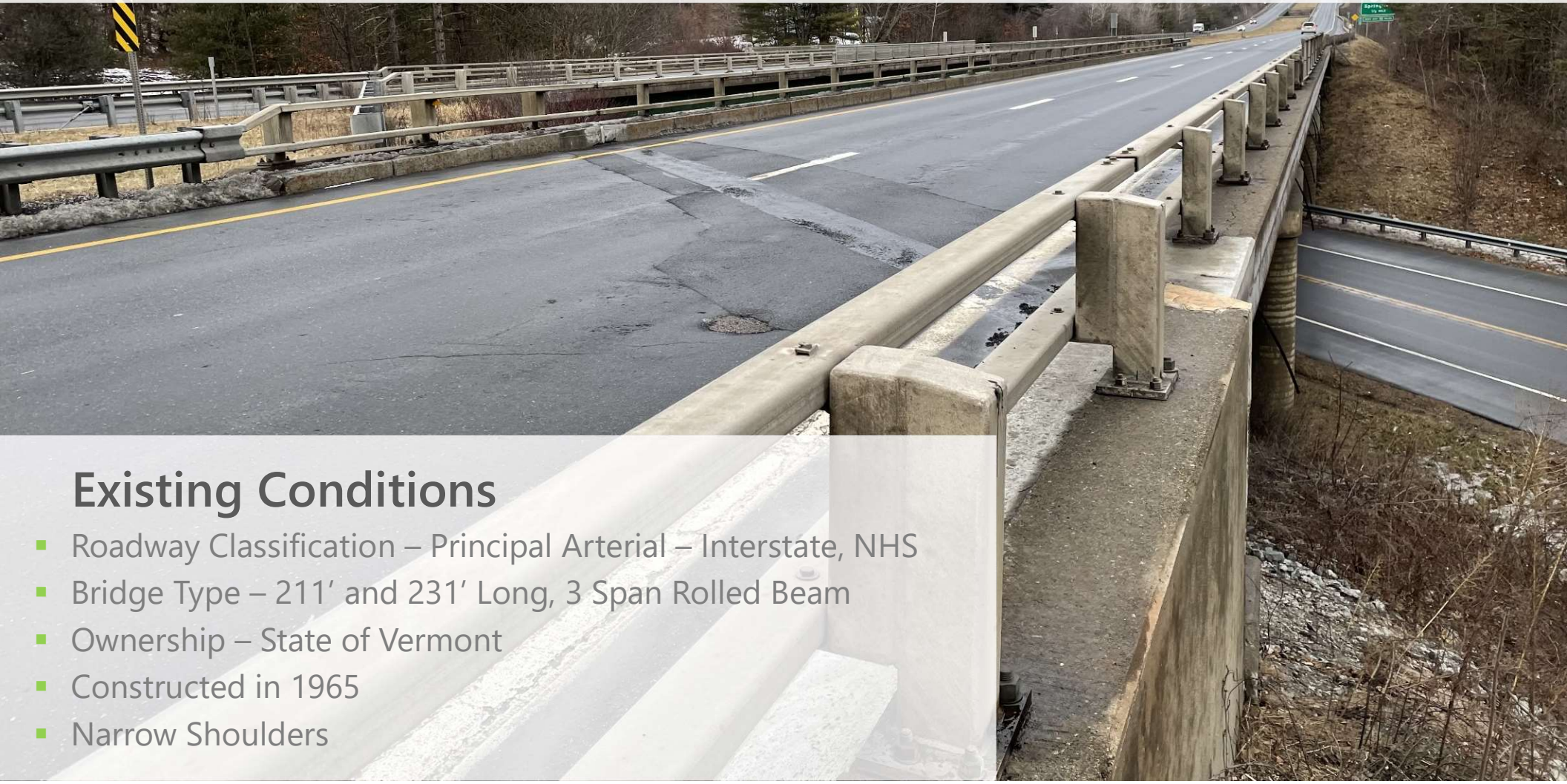
- Overview of Project
- Convey evaluations and recommendations
- Discuss maintenance of traffic
- Identify schedule and estimated costs
- Collect input from the community

Project Location



Bridges 25 N&S Evaluation

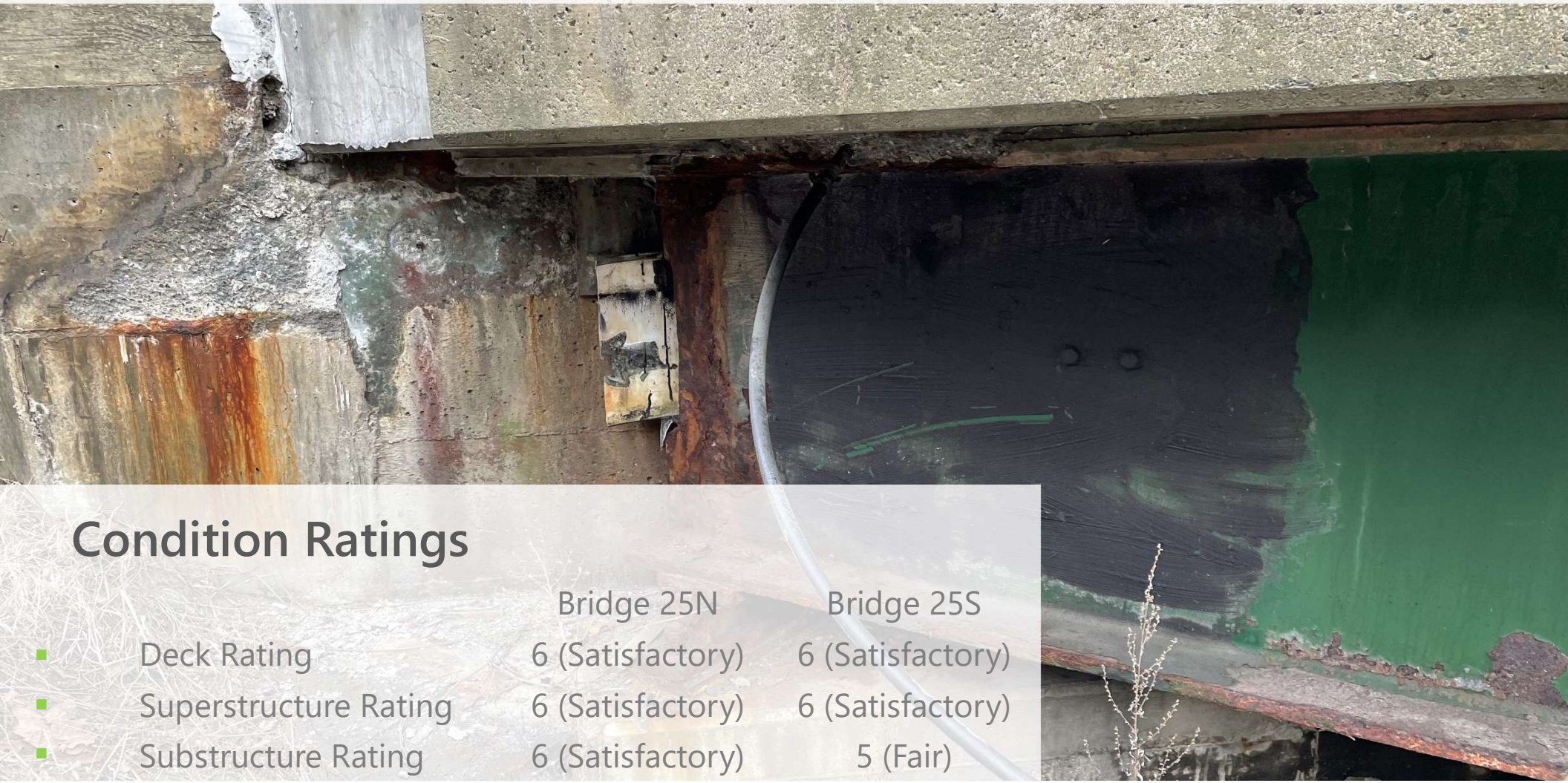
Looking North over Bridge 25N



Existing Conditions

- Roadway Classification – Principal Arterial – Interstate, NHS
- Bridge Type – 211’ and 231’ Long, 3 Span Rolled Beam
- Ownership – State of Vermont
- Constructed in 1965
- Narrow Shoulders

Existing Conditions - Bridges 25 N&S



Condition Ratings

	Bridge 25N	Bridge 25S
Deck Rating	6 (Satisfactory)	6 (Satisfactory)
Superstructure Rating	6 (Satisfactory)	6 (Satisfactory)
Substructure Rating	6 (Satisfactory)	5 (Fair)

Existing Conditions - Bridges 25 N&S

Deck Condition - Patches, cracks, and efflorescence

Alternatives Considered - Bridges #25 N&S

- No Action
  - Additional maintenance required within 10 years
- Rehabilitation
  - Deck patching/repair existing patches, replace wearing surface and membrane, replace joints (APJ and strip seal), replace abutment bearings, patch abutment backwalls and bridge seats, replace bridge railings and overhangs
  - 20-year design life
- Deck Replacement
  - New deck and joints, new abutment bearings, patch bridge seats, consider integral backwall, wider shoulders
  - 40-year design life
- Deck Replacement with Widening
  - New deck and joints, new abutment bearings, patch bridge seats, additional girder added to the exterior, consider integral backwall
  - Widens shoulders to the current standards
  - 40-year design life
- Full Bridge Replacement On Alignment
  - Maintain existing alignment
  - Route 5 Profile adjustments for vertical clearance
  - 100-year design life

Alternatives Considered - Bridges #25 N&S

Alternative	Bridge Removal	Bridge Cost	Service Life	Annualized Cost
No Action	$0	$0	N/A	N/A
Rehabilitation	$120,000	$1,012,000	20 yrs	$56,600
Deck Replacement	$609,000	$1,853,000	40 yrs	$61,550
Widening	$609,000	$2,928,000	40 yrs	$70,740
Replacement	$1,008,000	$7,656,000	100 yrs	$86,640

Alternatives Considered - Bridges #25 N&S

Alternative	Bridge Removal	Bridge Cost	Service Life	Annualized Cost
No Action	$0	$0	N/A	N/A
Rehabilitation	$120,000	$1,012,000	20 yrs	$56,600
Deck Replacement	$609,000	$1,853,000	40 yrs	$61,550
Widening	$609,000	$2,928,000	40 yrs	$70,740
Replacement	$1,008,000	$7,656,000	100 yrs	$86,640

Bridges 26 N&S Evaluation

Alternatives Considered - Bridges #26 N&S

- Scoped in 2016
- Re-Evaluated Report vs MAOS Recommendation
  - Deck Replacement with Field Splices
    - New deck, replace pin and link system in central span with field splices, wider shoulders
    - 40-year design life
  - Deck Replacement with Central Span Replacement
    - New deck, replace pin and link system and central girder segments with continuous field splices, wider shoulders
    - 40-year design life
  - Superstructure Replacement
    - New deck, replace superstructure with similar girders to utilize the existing substructure, wider shoulders
    - 50-year design life
- Also need to consider seismic resiliency/bearing replacement, stone fill sloughing, abutment undermining, construction schedule, access

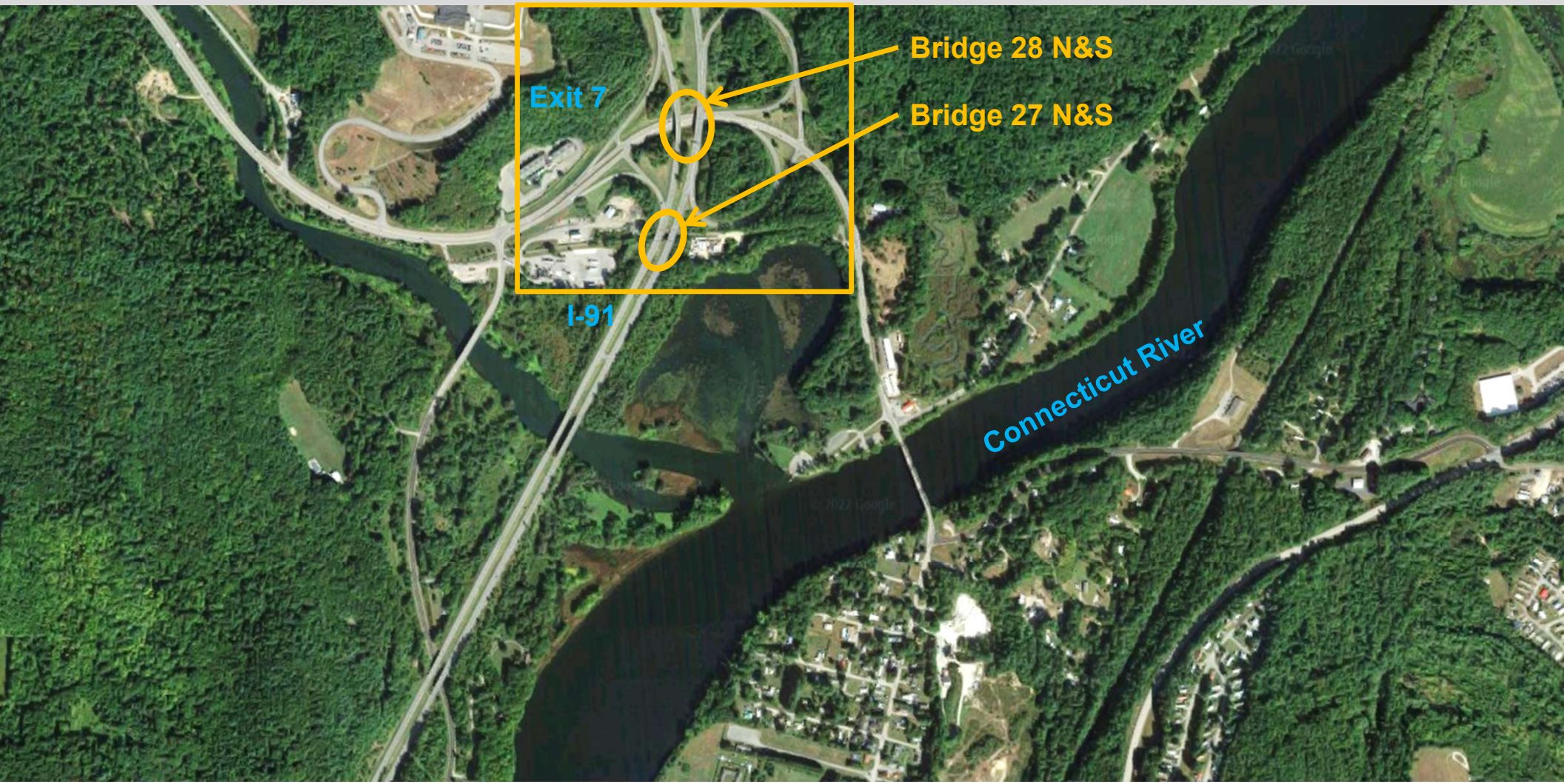
Alternatives Considered - Bridges #26 N&S

Alternative	Bridge Removal	Bridge Cost	Service Life	Annualized Cost
Deck w/ Field Splices	$507,800	$5,024,800	40 yrs	$138,315
Deck w/ Central Span	$507,800	$5,349,400	40 yrs	$146,430
Super. Replacement	$1,085,000	$5,039,600	50 yrs	$122,490

Alternatives Considered - Bridges #26 N&S

Alternative	Bridge Removal	Bridge Cost	Service Life	Annualized Cost
Deck w/ Field Splices	$507,800	$5,024,800	40 yrs	$138,315
Deck w/ Central Span	$507,800	$5,349,400	40 yrs	$146,430
Super. Replacement	$1,085,000	$5,039,600	50 yrs	$122,490

Exit 7 Evaluations



Exit 7 Conditions and Considerations

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- NB slip lanes on Route 5 - High speed merges/conflicts

Exit 7 Conditions and Considerations

Bridges 28 N&S Evaluation

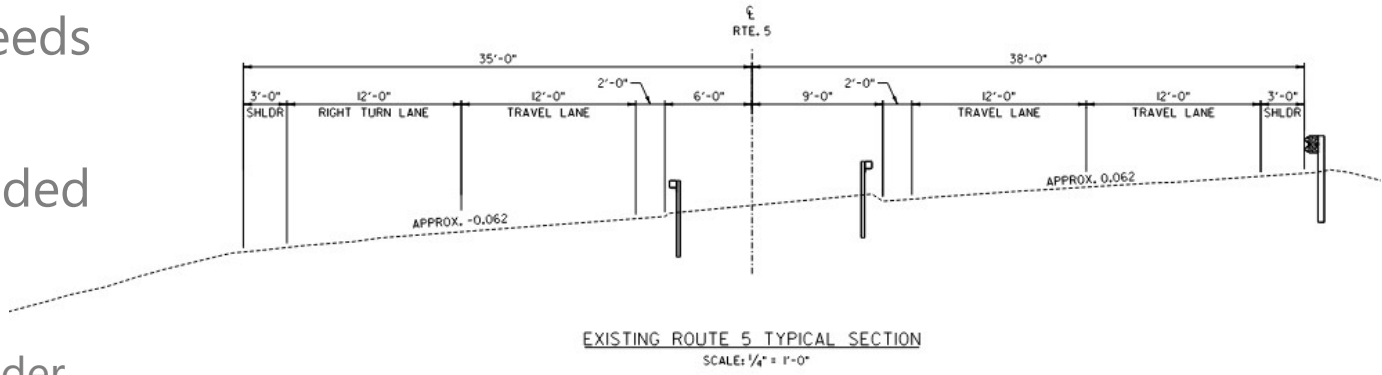
Looking North over Bridge 28S

Existing Conditions – Bridges #28N&S

- Roadway Classification – Principal Arterial – Interstate, NHS
- Bridge Type – 202’ & 207’ Long, Three-Span Rolled Beam
- Ownership – State of Vermont
- Constructed in 1965
- Interchange weave lane located on Bridge 28N

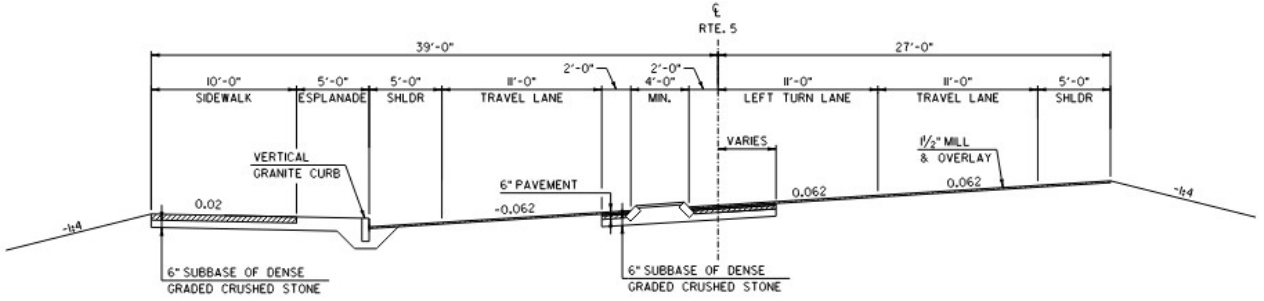
Recommended Alternative- Bridges #28 N&S

- Bridges have Multiple Needs
- Substandard Widths
- Replacement Recommended
  - Span Configuration to be Determined
  - Route 5 Reconfiguration Under Bridge



EXISTING ROUTE 5 TYPICAL SECTION

SCALE: 1/4" = 1'-0"



PROPOSED ROUTE 5 TYPICAL SECTION WITH TRAIL

SCALE: 1/4" = 1'-0"

Bridges 27 N&S Evaluation

Looking North over Bridge 27S

Existing Conditions – Bridges #27N&S

- Roadway Classification – Principal Arterial – Interstate, NHS
- Bridge Type – 74’ Long, Single Span Rolled Beam
- Ownership – State of Vermont
- Constructed in 1965
- Highway On-ramp lane located on Bridge 27S

Existing Conditions - Bridges #27 N&S

Metal Bin Walls - Failure and Deterioration

Alternatives Considered - Bridges #27 N&S

- No Action
  - Additional maintenance required within 10 years
- Rehabilitation
  - Replace wearing surface, replace deck overhangs and bridge railings, patch concrete deck, replace joints, patch abutments and wingwalls, clean bridge seats and correct backfill fines, address failing metal bin walls with strengthening the walls or raising trail grade
  - 20-year design life
- Deck Replacement
  - New deck and joints, new integral backwalls, new abutment bearings, patch abutments and wingwalls, clean bridge seats and correct backfill fines, address failing metal bin walls with strengthening the walls or raising trail grade
  - 40-year design life
- Bridge Replacement with a Buried Structure
  - Alignment adjustments to accommodate Bridge 28 N&S
  - 100-year design life
- Bridge Removal
  - Relocate Toonerville Rail Trail, fill in existing sections, replace with at grade roadway
  - Alignment adjustments to accommodate Bridge 28 N&S

Alternatives Considered - Bridges #27 N&S

- No Action
  - Additional maintenance required within 10 years
- Rehabilitation
  - Replace wearing surface, replace deck overhangs and bridge railings, patch concrete deck, replace joints, patch abutments and wingwalls, clean bridge seats and correct backfill fines, address failing metal bin walls with strengthening the walls or raising trail grade
  - 20-year design life
- Deck Replacement
  - New deck and joints, new integral backwalls, new abutment bearings, patch abutments and wingwalls, clean bridge seats and correct backfill fines, address failing metal bin walls with strengthening the walls or raising trail grade
  - 40-year design life
- Bridge Replacement with a Buried Structure
  - Alignment adjustments to accommodate Bridge 28 N&S
  - 100-year design life
- Bridge Removal
  - Relocate Toonerville Rail Trail, fill in existing sections, replace with at grade roadway
  - Alignment adjustments to accommodate Bridge 28 N&S

Alternatives Considered - Bridges #27 N&S

Alternative	Bridge Removal	Bridge Cost	Service Life	Annualized Cost
No Action	$0	$0	N/A	N/A
Rehabilitation	$45,000	$657,800	20 yrs	$35,130
Deck Replacement	$240,000	$906,600	40 yrs	$28,665
Widening	$288,000	$1,054,600	40 yrs	$33,565
At-Grade Replacement	$407,000	$3,290,400	100 yrs	$36,975
Buried Structure	$360,000	$2,133,000	100 yrs	$24,930
Disinvestment	$360,000	$760,000	>100 yrs	Approaches $0

Alternatives Considered - Bridges #27 N&S

Alternative	Bridge Removal	Bridge Cost	Service Life	Annualized Cost
No Action	$0	$0	N/A	N/A
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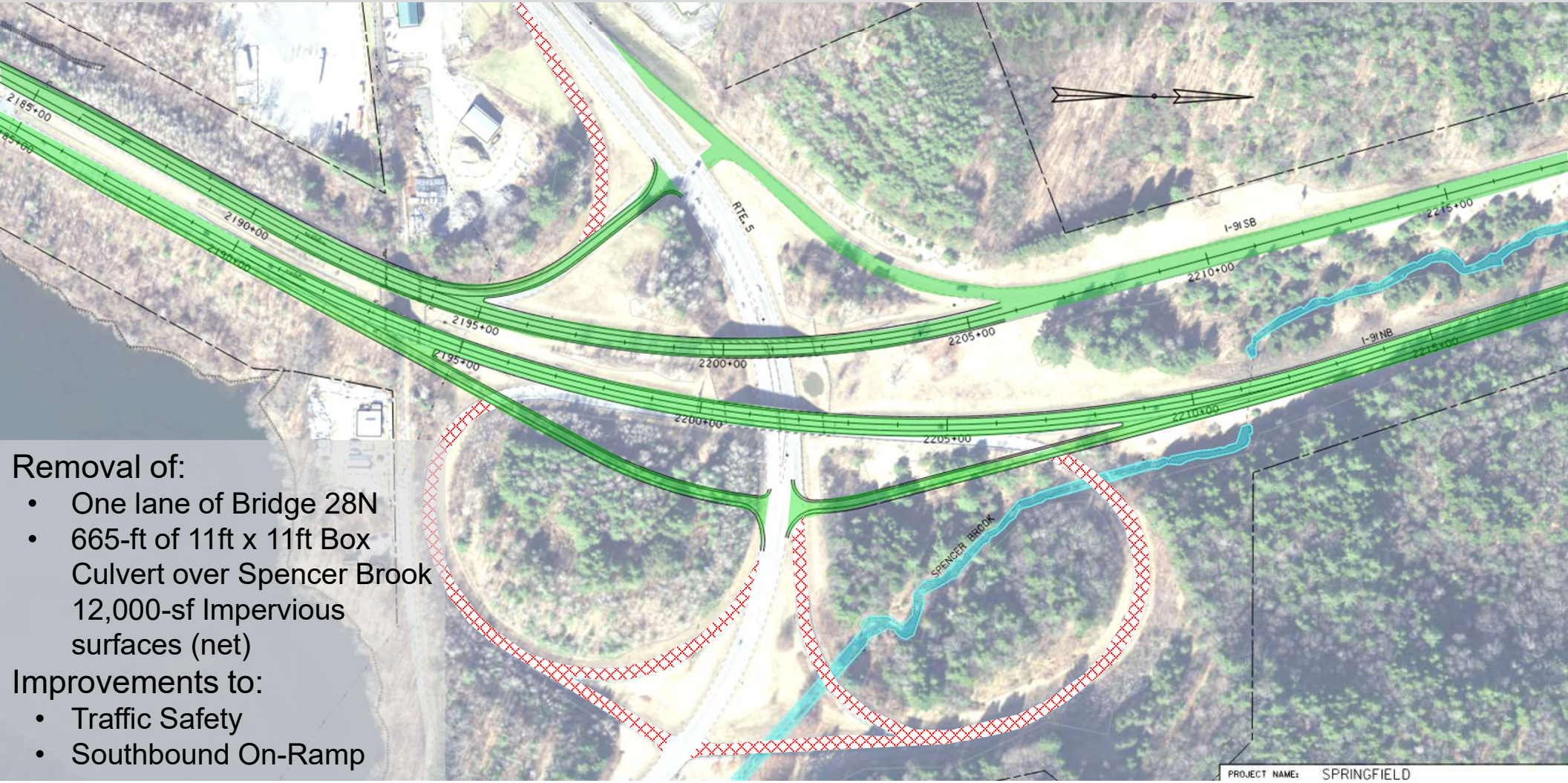
Buried Structure	$360,000	$2,133,000	100 yrs	$24,930
Disinvestment	$360,000	$760,000	>100 yrs	Approaches $0

Exit 7 Final Conditions



Removal of:

- One lane of Bridge 28N
- 665-ft of 11ft x 11ft Box Culvert over Spencer Brook
  12,000-sf Impervious surfaces (net)

Improvements to:

- Traffic Safety
- Southbound On-Ramp

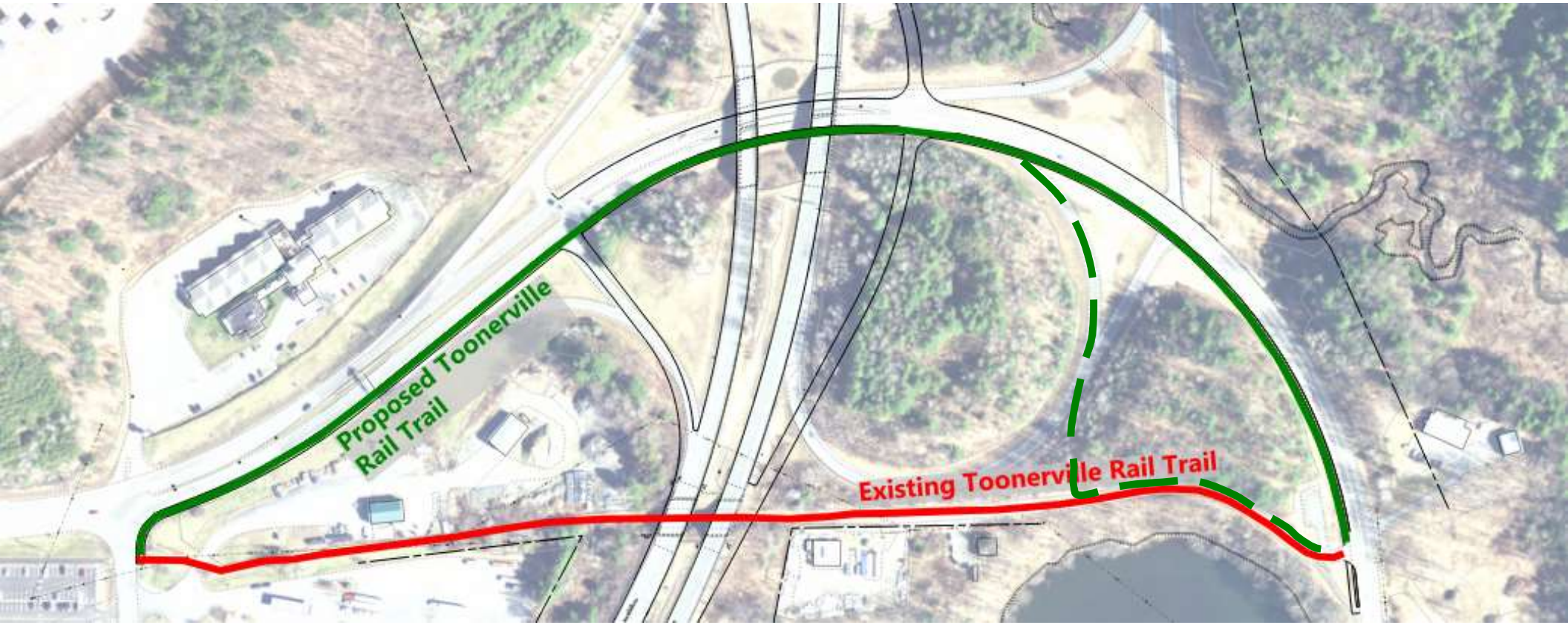
Toonerville Rail Trail Examples

Toonerville Rail Trail Examples

Toonerville Rail Trail Examples

Trail Alternatives Considered - Bridges #27 N&S

- Relocate Toonerville Rail Trail to Route 5 below Bridges #28 N&S
  - Approximately 0.1-mile trail length increase with same trail connection points
- Incorporate a Buried Structure



Toonerville Rail Trail Example Alternatives

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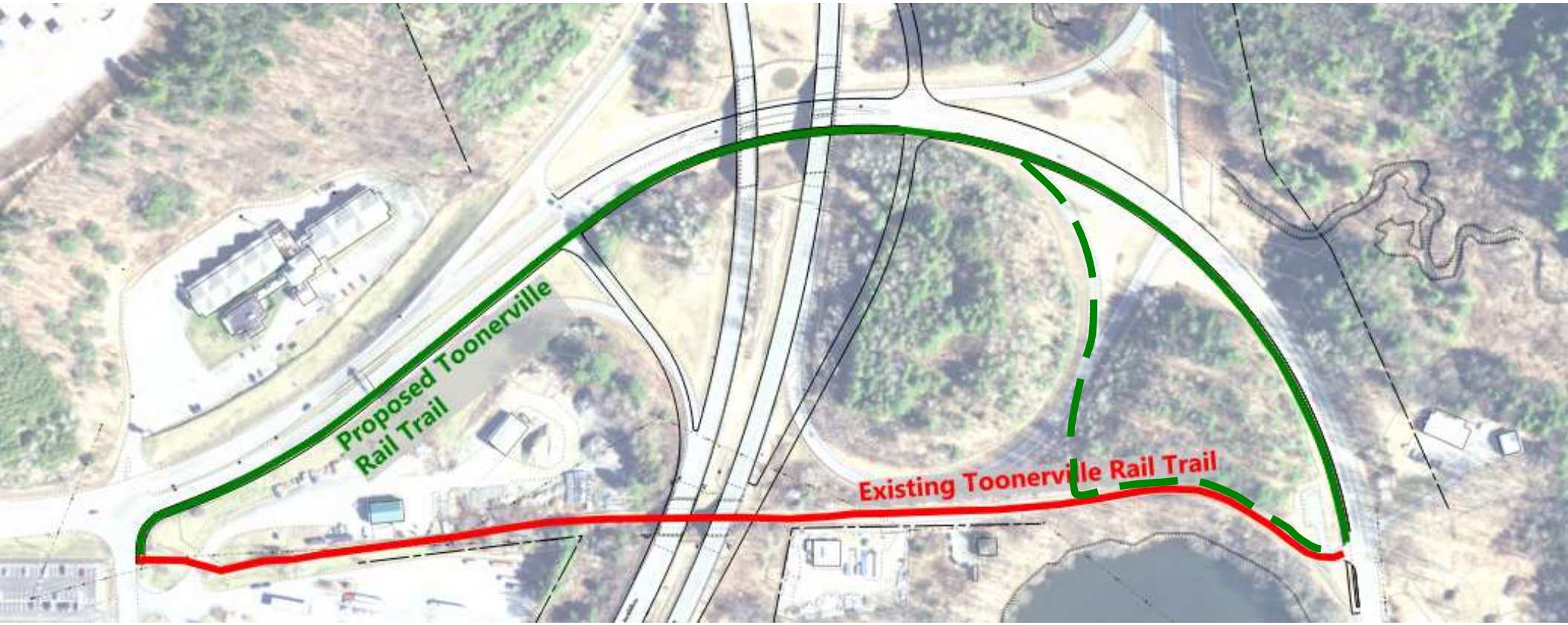
Rail Trail Recommendation

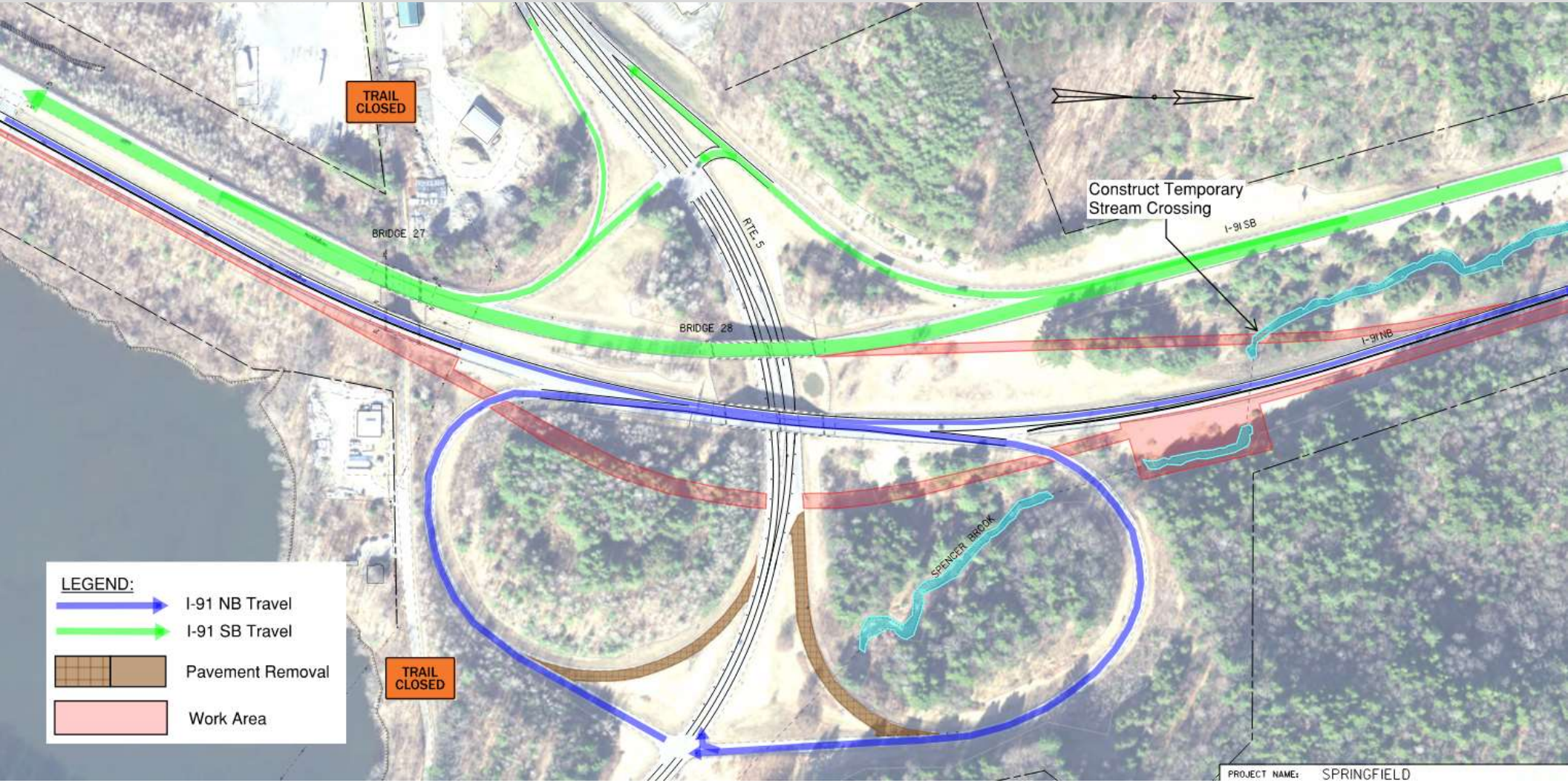
- Relocate Toonerville Rail Trail to Route 5 below Bridges #28 N&S
  - Reduced Initial and Long-Term Costs
  - Increased Visibility



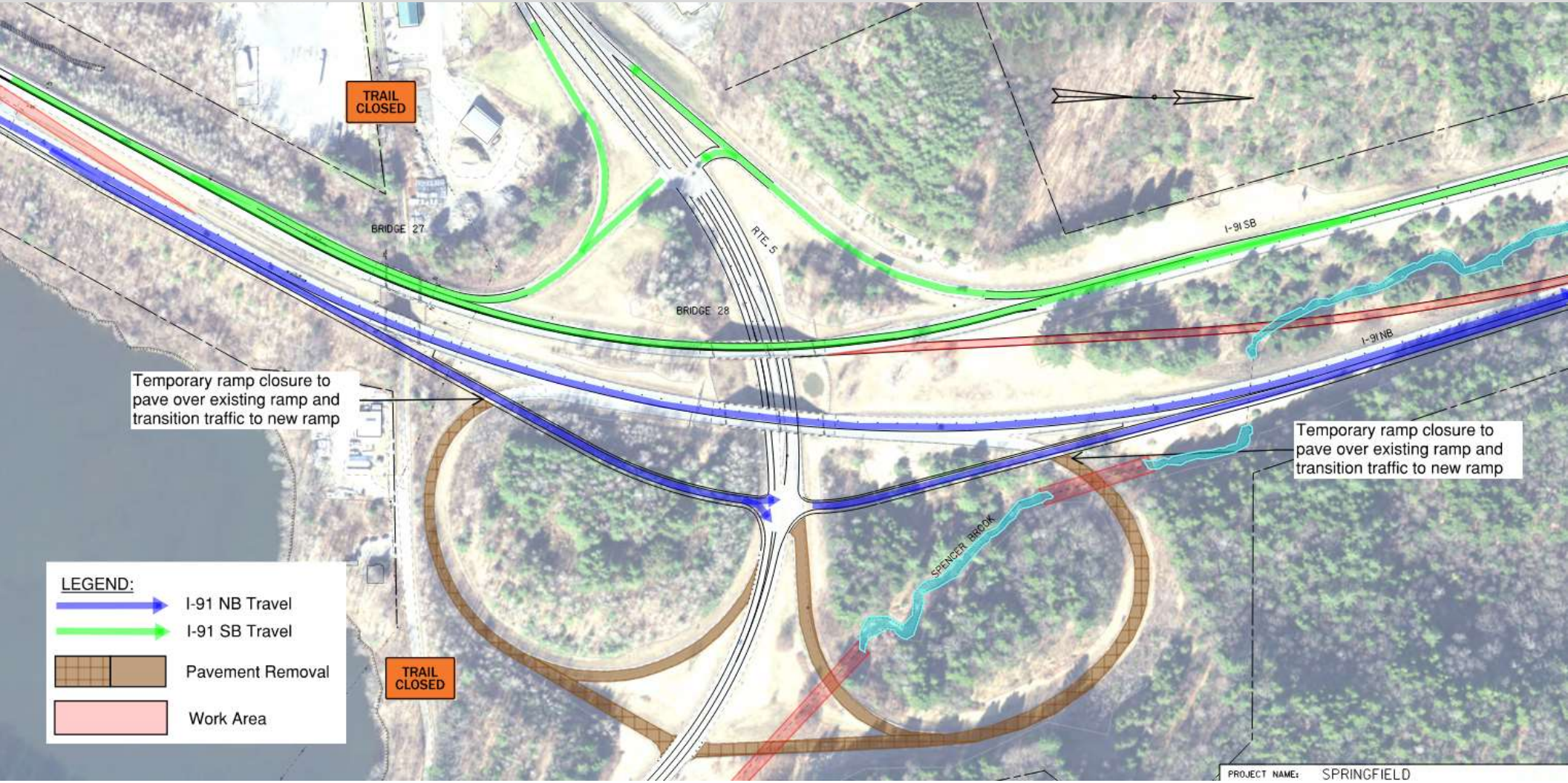
Maintenance of Traffic

- Crossovers for Bridges 25 and 26
- Options Evaluated for Bridges 27 and 28 (Exit 7)
    1. Temporary Bridge
    2. Phased Construction
    3. Off-Alignment Construction
    4. Median Crossovers
- Did not consider Accelerated Bridge Construction
- Pedestrian traffic along Toonerville Rail Trail may be closed for prolonged durations throughout construction.

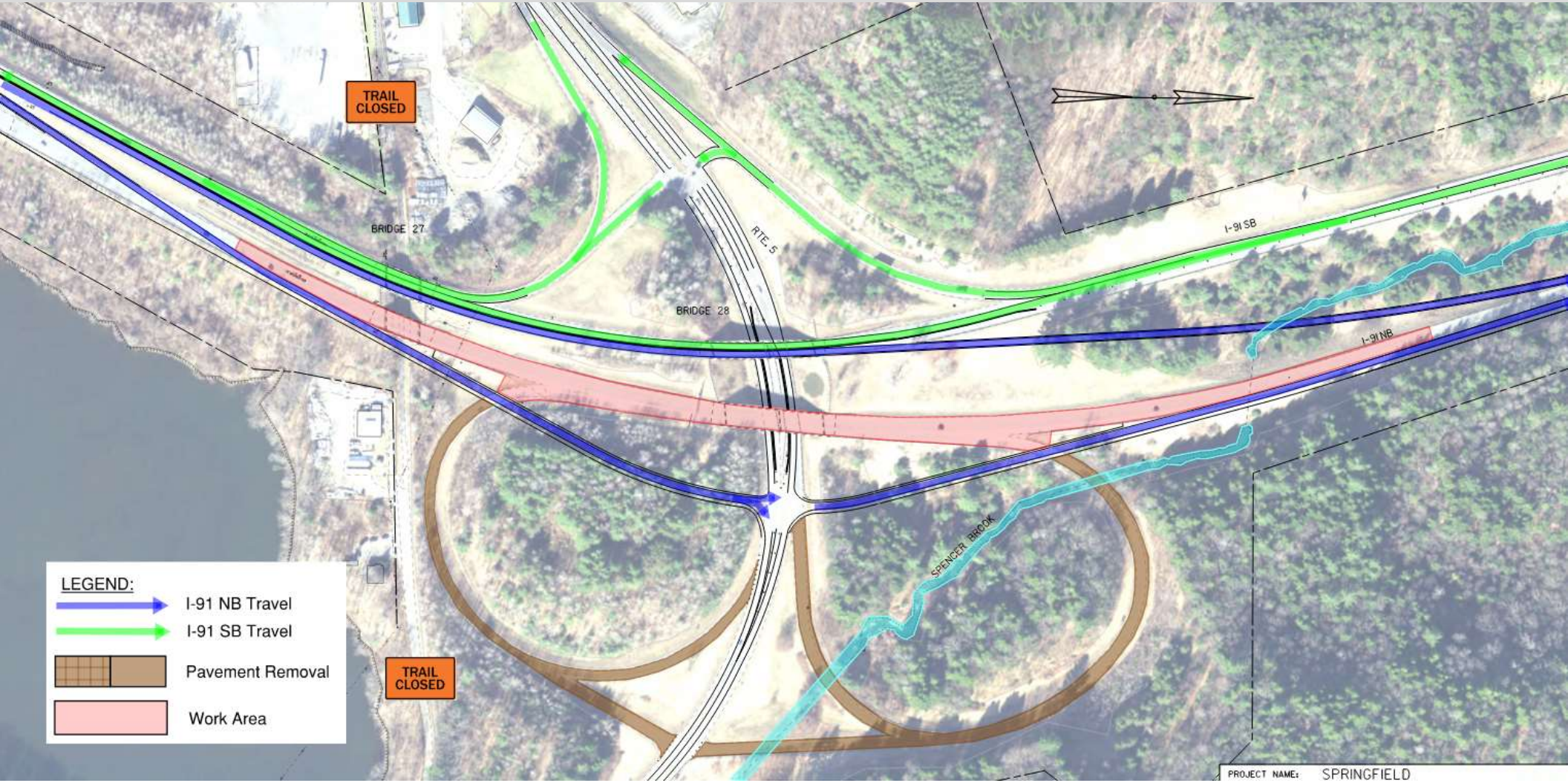
Alt 4B - Phase 1



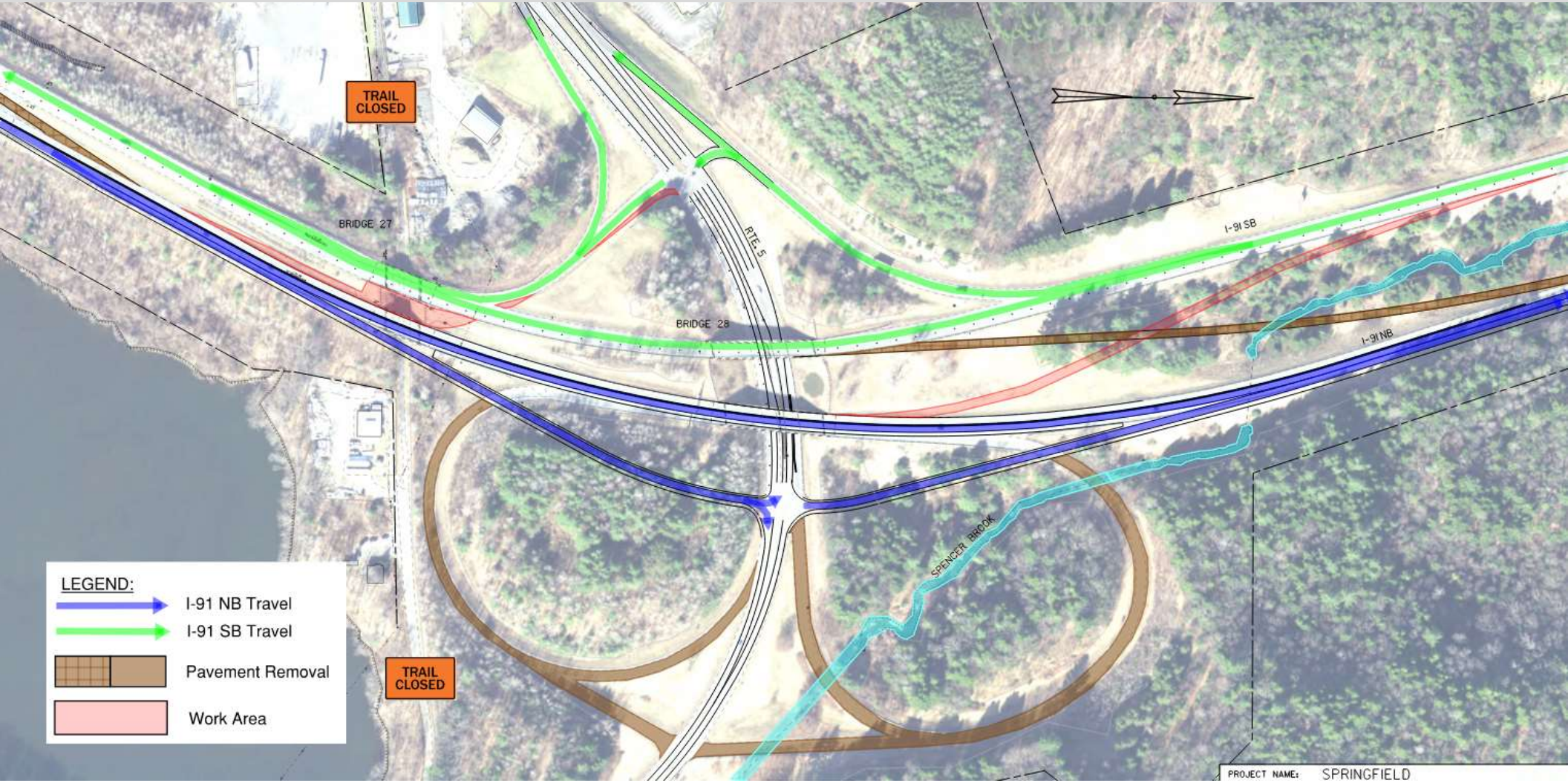
Alt 4B - Phase 2A



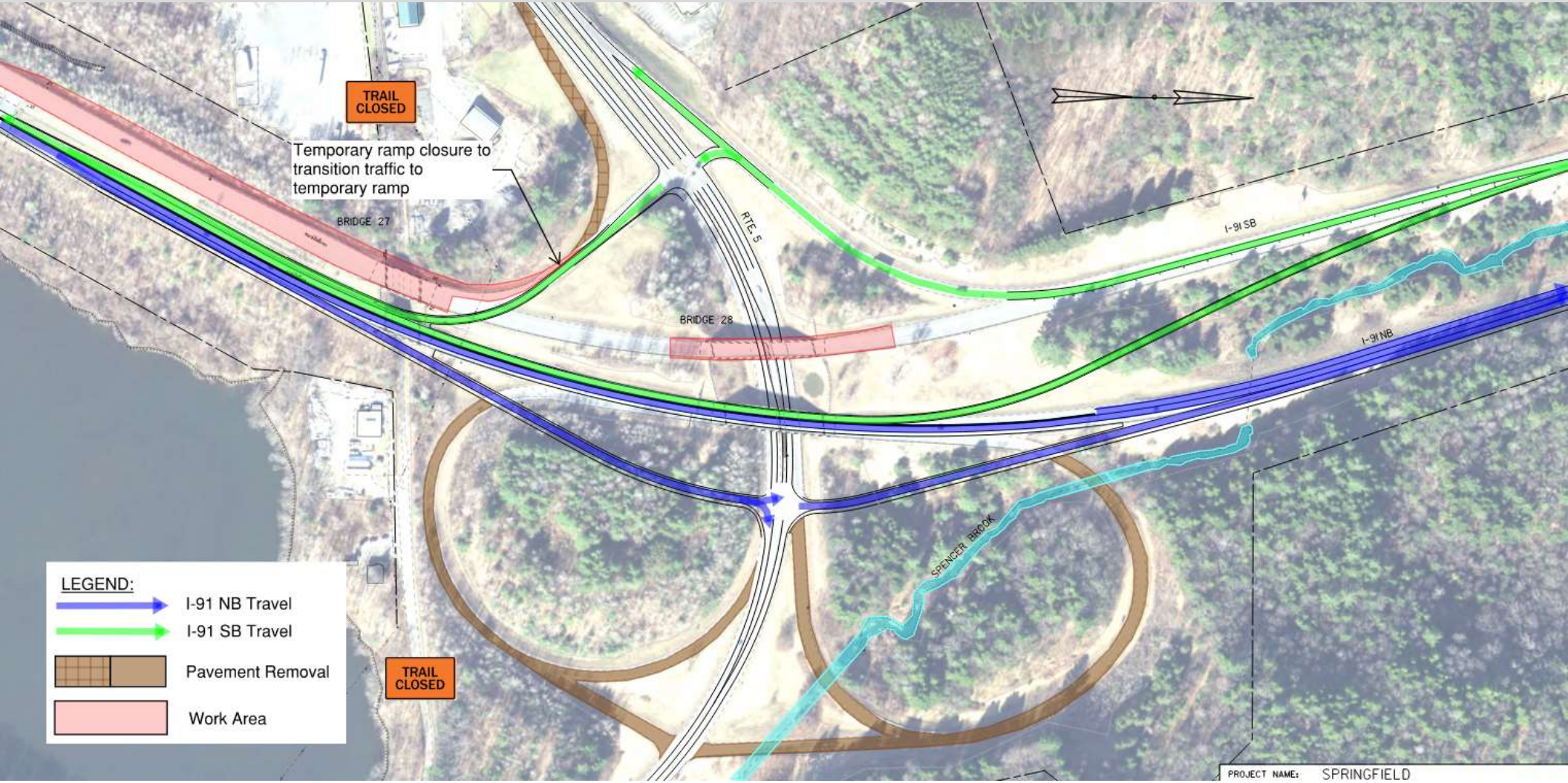
Alt 4B - Phase 2B



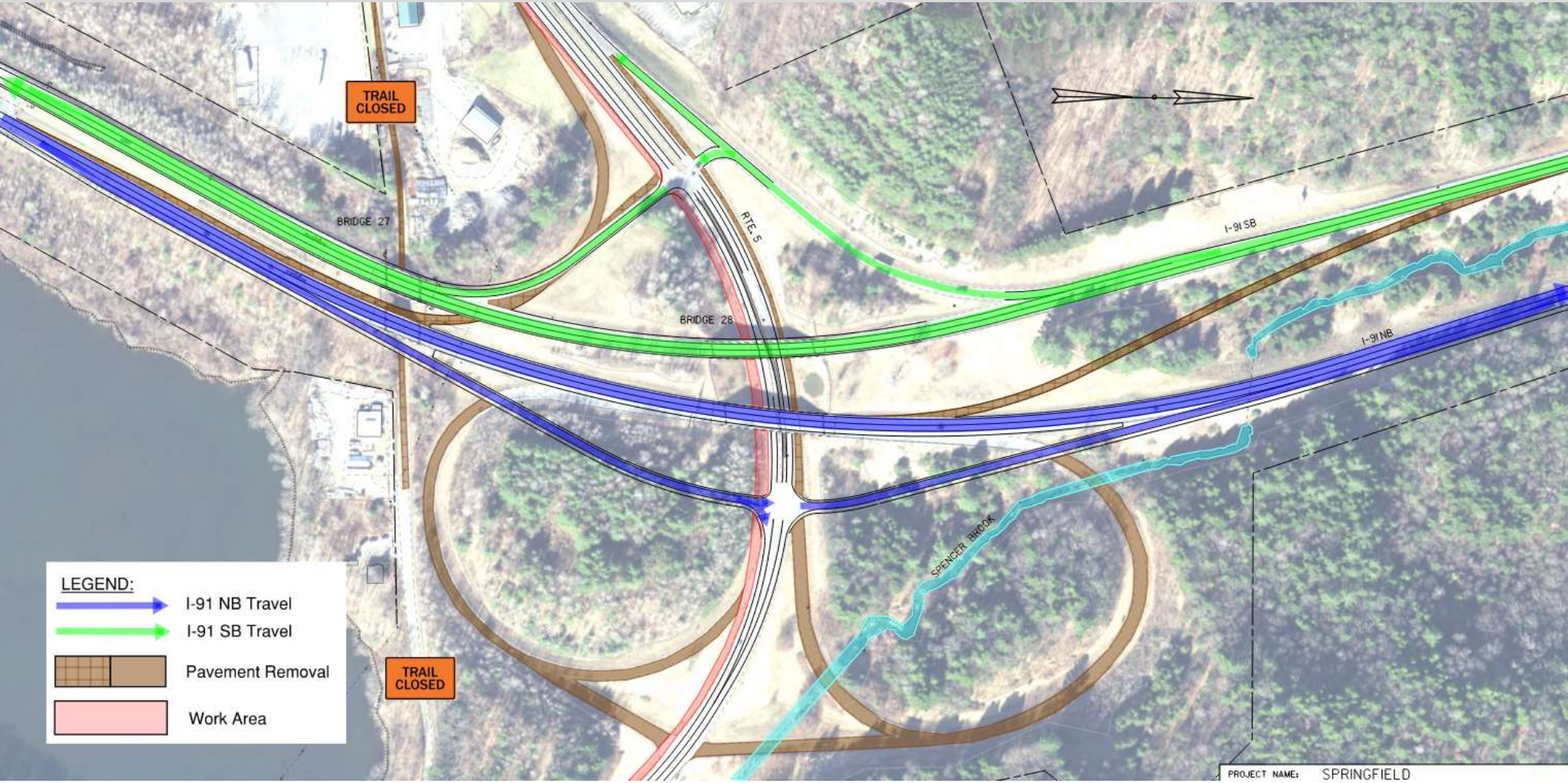
Alt 4B - Phase 3A



Alt 4B - Phase 3B



Alt 4B - Phase 4



Alt 4B – Final Condition

Multi-Modal Accommodations During Construction

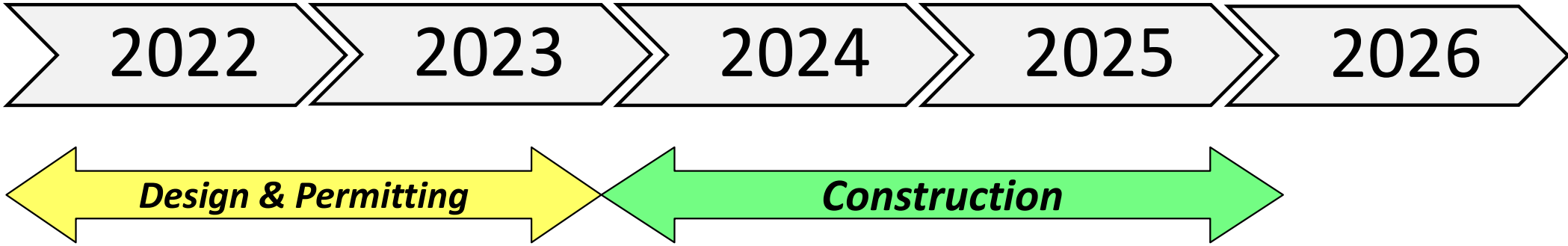
- Trail closures likely during:
  - Certain demolition phases
  - Certain construction phases
  - Until the slip lanes are removed/closed

Project Recommendations

- Bridges:
  - Bridges #25 N&S – Deck Replacement
  - Bridges #26 N&S – Superstructure Replacement
  - Bridges #27 N&S – Disinvestment and Relocation of Trail
  - Bridges #28 N&S – Full Replacement
- Maintenance of Traffic – Alternative 4B, Crossovers
- Removal of:
  - Two Bridges (27 N&S)
    - Removes need of future maintenance
  - One lane of Bridge 28N
  - 665-ft of 11ft x 11ft Box Culvert over Spencer Brook (28-1G and 28-1C)
  - 12,000-sf Impervious surfaces (net)
- Improvements to:
  - Traffic Safety
  - Southbound On-Ramp

Project Schedule and Cost Estimate

- Construction anticipated to last 2½ -3 years



- Estimated Project Cost: $46-million

*** All costs and dates are estimates and will be refined as the design progresses.*

Springfield IM 091-1(83)
Questions, Comments, and Open Discussion

Interstate 91 – Bridges #25 N&S over US Route 5
Interstate 91 – Bridges #26 N&S over Black River
Interstate 91 – Bridges #27 N&S over Toonerville Rail Trail
Interstate 91 – Bridges #28 N&S over US Route 5

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